

CLAIMS:

1. A method for forming a solder bonded sputter target/backing plate assembly comprising the steps of:

a) forming a backing plate with a bonding surface having at least two spaced-apart peripheral flanged segments disposed on the bonding surface of the backing plate;

b) forming a sputter target having a sputter surface and at least two peripheral notched segments on the bonding surface and said notched segments adapted for aligning with the flange segments;

c) applying a solder material to the interface spacing defined by superimposing and aligning said sputter target on the backing plate and said flange segments having a height thickness larger than the depth thickness of the notched segments; and

d) allowing said solder material to solidify and bond the sputter target to the backing plate.

2. The method of claim 1 wherein the backing plate and sputter target are disc-shaped.

3. The method of claim 1 wherein the flange segments form a single arcuate-shaped flange and the notched segments form a single arcuate-shaped notch.

4. The method of claim 3 wherein the height of the flange is between about .100 inch and .500 inch.

5. The method of claim 3 where the thickness of the width of the flange is between about .100 inch and about .500 inch.

6. The method of claim 1 wherein the depth of the notch is between about .010 inch and about .030 inch.

7. The method of claim 3 wherein the difference in the height thickness of the flange is between about 5% and about 20% larger than the depth thickness of the notch.

8. The method of claim 3 forming the backing plate with at least one protruding ridge within the flange and on the bonding surface of the backing plate and said ridge having a width of between about .100 inch and about .500 inch.

9. The method of claim 8 wherein the at least one ridge on the bonding surface of the backing plate have a shape selected from the group comprising a circle, arcuate, square, rectangular, polygon and combination thereof.

10. The method of claim 1 wherein the sputter target is selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, and alloys thereof and the backing plate is selected from the group

comprising copper, aluminum, titanium, and alloys thereof and the backing plate is selected from the group comprising copper, aluminum, titanium, and alloys thereof.

11. A solder bonded sputter target/backing plate assembly comprising a backing plate having at least two spaced-apart, peripheral flanges disposed on the bonding surface of said backing plate; a sputter target having a sputtering surface and at least two peripheral notched segments on the sputtering surface, said notched segments of the sputter target superimposed and aligned onto and within the flanges on the bonding surface of the backing plate; and the bonding surface of the sputter target and the bonding surface of the backing plate bonded together to form a sputter target/backing plate assembly.

12. The solder bonded sputter target/backing plate assembly of claim 11 wherein the sputter target has a single peripheral notch and is selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, and alloys thereof and the backing plate has a single peripheral flange and is selected from the group comprising copper, aluminum, titanium, and alloys thereof.

13. A method for forming a solder bonded sputter target/backing plate assembly comprising the steps of:

- a) forming a backing plate with a bonding surface having at least two spaced-apart peripheral flange segments and a spacer element disposed on the inner walls of the flange segments and the peripheral edge of the bonding surface of the backing plate; said spacer elements having a height equivalent to the thickness of the height of the intended solder bond;
- b) forming a sputter target having a sputter surface and a bonding surface and having a size to accommodate the spaced apart flange segments;
- c) applying a solder material to the interface spacing defined by superimposing and aligning said sputter target between the flange segments onto the spacer element;
- d) allowing said solder material to solidify and bond the sputter target to the backing plate; and
- e) removing said flange segments from the backing plate.

14. The method of claim 13 wherein the backing plate and sputter target are disc-shaped.

15. The method of claim 13 wherein the flange segments are removed.

16. The method of claim 13 wherein the height of the flange is between about .100 inch and .500 inch, and the thickness of the width of the flange is between about .100 inch and about .500 inch.

17. The method of claim 13 wherein the sputter target is selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, and alloys thereof and the backing plate is selected from the group comprising copper, aluminum, titanium, and alloys thereof.

18. A solder bonded sputter target/backing plate assembly comprising backing plate having at least two of spaced-apart removable peripheral flanges and a spacer element disposed on the bonding surface of said backing plate and said spacer element disposed on the peripheral edge of the bonding surface; and a solder bonded layer disposed between the sputter target and backing plate producing an effective uniform thickness solder bonded interface for the aligned sputter target/backing plate assembly.

19. The solder bonded sputter target/backing plate of claim 18 wherein the flange segments form a single arcuate-shaped flange and the notched segments form a single arcuate-shaped notch.

20. The solder bonded sputter target/backing plate assembly of claim 18 wherein the sputter target is selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium,

nickel, iron, manganese, germanium, or alloys thereof. The backing plate could be made of copper, aluminum, titanium, or alloys thereof and the backing plate is selected from the group comprising copper, aluminum, titanium, and alloys thereof and the backing plate is selected from the group comprising copper, aluminum, titanium, and alloys thereof, and the bonded solder is selected from the group comprising tin-lead, indium-tin, tin-silver, tin-copper, or tin-silver-copper.